Outline

- Introduction
- Funding
- Strategic Direction
- Technology Initiatives
- Conclusion
Air Force Science and Technology

- $2.2B program in 04 PB
- Single line item in budget covering:
  - Discovery -- Basic Research (6.1)
  - Development -- Applied Research – (6.2)
  - Demonstration -- Adv Tech Development (6.3)
- Thousands of individual projects
- Highly leveraged formal/informal partnerships/alliances
- Long-term in nature
- No guarantee of success
Air Force Research Laboratory (AFRL) Organization

Commander (CC)

- Air Vehicles (VA)
- Space Vehicles (VS)
- Information (IF)
- Munitions (MN)
- Directed Energy (DE)
- Materials & Manuf. (ML)
- Sensors (SN)
- Propulsion (PR)
- Human Effectiveness (HE)
- AFOSR

Integrity - Service - Excellence
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### AF S&T by Budget Activity

<table>
<thead>
<tr>
<th>BAC</th>
<th>FY03 PB</th>
<th>FY04 PB</th>
<th>CHANGE</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>219,144</td>
<td>322,041</td>
<td>102,897</td>
<td>47.0%</td>
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<tr>
<td>6.2</td>
<td>697,549</td>
<td>757,960</td>
<td>60,411</td>
<td>8.7%</td>
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<td>6.3</td>
<td>742,917</td>
<td>1,116,554</td>
<td>373,637</td>
<td>50.3%</td>
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<tr>
<td>TOTAL</td>
<td>1,659,610</td>
<td>2,196,555</td>
<td>536,945</td>
<td>32.4%</td>
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</tbody>
</table>

### FY04 PB Pie Chart
- **6.1** 15%
- **6.2** 35%
- **6.3** 50%
AF S&T President’s Budget by Technical Area

FY04 PB

<table>
<thead>
<tr>
<th>Tech Area</th>
<th>FY03 PB</th>
<th>FY04 PB</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIAL PROG</td>
<td>97,300</td>
<td>369,483</td>
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<tr>
<td>PROPULSION</td>
<td>243,529</td>
<td>283,763</td>
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<tr>
<td>BASIC RESEARCH</td>
<td>219,144</td>
<td>204,754</td>
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<tr>
<td>HPCM (DEV)</td>
<td>0</td>
<td>185,282</td>
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<tr>
<td>SENSORS</td>
<td>162,657</td>
<td>162,138</td>
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<tr>
<td>SPACE VEHICLES</td>
<td>100,897</td>
<td>155,354</td>
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<td>AIR VEH</td>
<td>123,006</td>
<td>142,078</td>
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<tr>
<td>MATERIALS &amp; MFG</td>
<td>121,888</td>
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<tr>
<td>INFORMATION</td>
<td>105,239</td>
<td>108,328</td>
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<tr>
<td>URI (DEV)</td>
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<tr>
<td>HUMAN EFFECTIVENESS</td>
<td>96,186</td>
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<td>DIRECTED ENERGY</td>
<td>85,794</td>
<td>93,420</td>
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<tr>
<td>MUNITIONS</td>
<td>98,344</td>
<td>76,971</td>
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<tr>
<td>HEL (DEV)</td>
<td>0</td>
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<td>DUAL USE</td>
<td>10,626</td>
<td>10,586</td>
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<tr>
<td>MILSATCOM</td>
<td>195,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,659,610</strong></td>
<td><strong>2,196,555</strong></td>
</tr>
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Air Force Science & Technology Program

Air Force S&T . . .

- Underpins the Air Force Vision
- Enables CSAF Task Force CONOPs
- Program is effectively focused
  - Emphasizing transition to the warfighter
  - Funding potential leap-ahead technologies

Global Vigilance, Reach and Power

Task Force Concept of Operations

Warfighter Technology Areas

Science & Technology Research

I n t e g r i t y  -  S e r v i c e  -  E x c e l l e n c e
AF Task Force CONOPS

Construct

Global Vigilance, Reach, Power

Air & Space Expeditionary Forces CONOPS

Global Strike Task Force CONOPS
Homeland Security Task Force CONOPS
Nuclear Response Task Force CONOPS
Global Response Task Force CONOPS
Global Mobility Task Force CONOPS
Space & C4ISR Task Force CONOPS

Enabling Capabilities
Capabilities Link to S&T Programs

Task Force Capabilities
1. Capability #1
2. Capability #2
3. Capability #3
4. Capability #4

S&T Program supporting a specific capability

Enabling Capability (to achieve desired effects)

Warfighter Technology Area (link to CONOPs)
Air Force Transformational Capabilities

- Information Superiority
  - Machine-to-machine interface
  - Reliable, secure bandwidth
  - Real-time, deep-look, target quality information
  - Ensured use of information
  - Deny adversary information

- Air and Space Superiority
  - 24/7 stealthy operations
  - Effective, persistent air-to-ground operations
  - Attack high risk, high payoff, time sensitive targets
  - Protect space assets
  - Deny adversary access to space
  - Launch, refuel, repair space vehicles
  - Detect and destroy missiles in flight

- Precision Engagement
  - Conduct high volume attacks with less platforms
  - Tailored effects

- Global Attack
  - Attack anywhere, anytime from anywhere with precision

- Rapid Global Mobility
  - Rapid delivery of right forces, right places, right time

- Agile Combat Support
  - Reduce footprint

AF Transformation Flight Plan Available at: http://www.xp.hq.af.mil/xpx/xpxt/t_index.htm
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Key Transformational Technology Focus

- Information Superiority
  - Joint Battlespace Infosphere
  - Multi-Sensor Fusion for Time Critical Targeting
  - Transformational Communication – Laser Communication

- Air and Space Superiority
  - Access to Space
  - Integrated Powerhead Demo
  - National Aerospace Initiative
  - Laser Hardened Materials
  - Infrared Countermeasures
  - Microsatellites – Proximity Ops
  - Space Based Radar

- Precision Engagement
  - WASAAMM with Data Link
  - Agent Defeat
  - Airborne Active Denial

- Global Attack
  - Targets Under Trees
  - Miniature Anti GPS Jam INS

- Rapid Global Mobility
  - Hydrocarbon Scramjet (X-43C)
  - Automated Air Refueling

- Agile Combat Support
  - Distributed Mission Ops
  - Integrated Panoramic NVG
  - Blast Mitigation
Proximity Operations
XSS-10 Program
Pathfinder for Microsatellite Proximity Operations

- First on-orbit flight demonstration of microsatellite proximity operations
- Launched 29 Jan 03; conducted 24-hour mission on 30 Jan 03
- Demonstrated:
  - Semi-autonomous and manual control of microsatellite on-orbit
  - Navigation and inspection of object of interest (Delta 2nd Stage) by microsat
  - Several advanced microsat technology components

~31kg XSS-10 microsatellite

- Mini-communications system (SGLS)
- Integrated imager and star camera
- Lightweight propulsion system
- Lithium polymer batteries
Integrated Panoramic Night Vision Goggle (IPNVG)
Laser IRCM Flyout Experiment (LIFE)

Provide laser-based on-board protection for large aircraft from 21st century electro-optical and infrared (IR) missiles.

Recent Accomplishments:
- Demonstrated closed-loop IR countermeasures (CLIRCM) adaptive techniques
- Demonstrated advanced missile warning capability
- Completed data analysis
- Planned insertion of LIFE capabilities into existing IRCM systems
- Performed affordability analysis for lasers, pointers, and missile warning to reduce transition risk
Blast Mitigation

Blast Resistant Polymers

- Elastomeric retrofit material
- Reduction in blast fragmentation hazard for occupants of buildings with masonry or lightly framed walls
Wide Area Search

- Autonomous target search & destroy
- Standoff attack
- Munition with multimode warhead
- Increased weapon load-out
- Highly effective mobile target weapon for Suppression of Enemy Air Defenses (SEAD) and Theater Missile Defense (TMD) missions

Precision guided weapon capability for attack of entire spectrum of ground mobile targets

Video from 4 Nov 2002 Guided Test
Outline

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Conclusion

- Diverse, highly leveraged program
- Near term increase in funding due to devolvement
- S&T focused on capabilities necessary to achieve TF CONOPS

S&T for the world’s best Air Force

"Global Vigilance, Reach and Power"
We defend America by unleashing the power of innovative science and technology.